

DECLARATION

I, Akihiro Matsumoto, a citizen of Japan, c/o Miyoshi & Miyoshi of Toranomon Kotohira Tower, 1-2-8 Toranomon, Minato-ku, Tokyo 105-0001, Japan, do hereby solemnly and sincerely declare:

That I am well acquainted with the Japanese language and English language; and

That the attached is a true and faithful translation made by me of the Japanese document, namely Japanese Patent Application No. 2002-239086 to the best of my knowledge and belief.

This 29th day of June 2007


Akihiro Matsumoto

[NAME OF DOCUMENT] Patent application
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[TITLE OF INVENTION] INTERVERTEBRAL SPACER
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[LIST OF ATTACHED DOCUMENTS]

[NAME OF ARTICLE] One copy of specification

[NAME OF ARTICLE] One copy of drawing

[NAME OF ARTICLE] One copy of abstract

[NUMBER OF GENERAL POWER OF ATTORNEY] 0005145

[PROOF] Required

[Name of Document] Specification
[Title of the Invention] INTERVERTEBRAL SPACER
[What is Claimed is]

[Claim 1]

An intervertebral spacer inserted between vertebrae of a spine, wherein each of upper and lower surfaces of the intervertebral spacer is formed in a curved surface having a top portion at a middle portion in the back and forth direction.

[Claim 2]

The intervertebral spacer according to claim 1, wherein a plurality of claw portions for preventing withdrawal are formed on the upper and lower surfaces of the intervertebral spacer.

[Claim 3]

The intervertebral spacer according to claim 1 or 2, wherein the intervertebral spacer is formed in a shape of a curved surface that is tapered toward a front side.

[Detailed Description of the Invention]

[0001]

[Technical Field to Which the Invention Belongs]

The invention relates to an intervertebral spacer that is inserted between vertebrae, after an intervertebral disk is previously removed, and more specifically, an intervertebral spacer that is easily inserted between vertebrae and is put into contact in almost whole area with an end plate of the vertebra.

[0002]

[Prior Art]

There have been known intervertebral spacers of related art as described in the following document.

[0003]

[Patent Document 1] Japanese Patent Application Laid-Open No. 2002-95685

As shown in Fig. 3(A), a thickness of a rear side 101 of an intervertebral spacers 100 is larger than that of a front side 103 of an intervertebral spacers 100 according to Patent Document 1. An upper surface 105U and a lower surface 105L of the intervertebral spacers 100 are slanting each other, and are flat planes. Each of the slanting upper and lower surfaces 105U and 105L has a plurality of conical protruding portions 107.

[0004]

The intervertebral spacer 100, as shown in Fig. 3(B) and 3(C), is inserted between vertebrae 109A and 109B from a posterior side after an intervertebral disk is removed.

[0005]

[Problems to be Solved by the Invention]

In the related art, the protruding portions 107 enhance an effect of preventing the intervertebral spacer 100 from coming off. However, the intervertebral spacer 100 has the following problems: since the front side 103 of the spacer 100 is thicker than that of the rear side 101, it is hard to insert the intervertebral spacer 100 between the upper and lower vertebrae 109A and 109B; further, since the upper and lower surfaces 105U and 105L are slanting each other, the end plates of the upper and lower vertebrae 109A and 109B are not put into whole surface contact with the upper and lower surfaces 105U and 105L. Hence, the contact area between them becomes small, so that the intervertebral spacer 100 can not stably fix the vertebrae 109a and 109B.

[0006]

[Means for Solving the Problems]

This invention has been made to solve the problems. According to claim 1 of the invention, there is provided an intervertebral spacer inserted between vertebrae of a spine, wherein each of upper and lower surfaces of the intervertebral spacer is formed in a curved surface having a top portion at a middle portion in the back and forth direction.

[0007]

According to claim 2 of the invention, there is provided the intervertebral spacer according to claim 1, wherein a plurality of claw portions for preventing withdrawal are formed on the upper and lower surfaces of the intervertebral spacer.

[0008]

According to claim 3 of the invention, there is provided the intervertebral spacer according to claim 1 or 2, wherein the intervertebral spacer is formed in a shape of a curved surface that is tapered toward a front side.

[0009]

[Mode for Carrying out the Invention]

Specific embodiments of the invention are described below referring to the drawings. The constituent parts performing the same functions as the constituent parts shown in the prior art are denoted by the same reference symbols.

[0010]

As shown in Fig. 1, an intervertebral spacer 1 according to a first embodiment of the present invention is inserted between the vertebrae after an intervertebral disk is removed. Each of upper and lower surfaces 5 and 7 of a spacer main body is formed in a protruded curved surface having a top portion 13 at a middle portion between a front end portion 9 and a rear end portion 11.

[0011]

The front end portion 9 of the spacer main body 3 is formed in a tapered curved surface, for example, a spherical surface such that its forefront side gradually becomes small. In a rear end portion 11 of the spacer main body 3, a tool engagement portion 15 is provided. A tool such as a pair of forceps is engaged with the tool engagement portion 15 when the spacer main body 3 is inserted between the vertebrae.

[0012]

On an upper surface 5 and a lower surface 7 of the spacer main body 3, claw portions 17 for preventing withdrawal (withdrawal prevention portion) are formed. Each withdrawal prevention portion (claw portion) 17 is formed in the shape of a triangle in cross section in the direction of insertion, in which a slanting angle in the direction of insertion is small and a slanting angle in the direction of withdrawal is larger than the slanting angle in the direction of insertion so that the intervertebral spacer 1 can be easily inserted when it is inserted from the front end portion 9 between the vertebrae after the intervertebral disk is removed, and the intervertebral spacer 1 is not easily withdrawn.

[0013]

In the spacer main body 3, the claw portions 17 on the upper and lower surfaces 5 and 7 are arranged along imaginary slanting planes 19A and 19B slanting in such a way that the distance between the upper surface 5 and the lower surface 7 becomes narrower in the rear side than in the front side. The ridges (vertexes) of the claw portions 17 are arranged along a curved surface 21A and 21B, and the top portion of the claw portions 17 is positioned at the middle portion in the back and forth direction of the spacer main body 3. The front end portion 9 formed in the tapered curved surface protrudes from near the portions where the slanting surfaces 19A and 19B cross the curved surfaces 21A and 21B at the front end side. The rear end surface is positioned near the portions where the slanting surfaces 19A

and 19B cross the curved surfaces 21A and 21B at the rear end side.

[0014]

As is the case with the related art, the front end portion 9 of the spacer main body 3 is inserted between the vertebrae from the rear side of the vertebrae after the intervertebral disk is removed. At this time, the spacer main body 3 can be easily inserted between the vertebrae since the front end portion 9 is formed in the tapered curved surface and an upper surface 5 and a lower surface 7 of the spacer main body 3 has claw portions 17 so that the intervertebral spacer 1 can be easily inserted and is not easily withdrawn.

[0015]

After the spacer main body 3 is inserted, the vertebrae sandwiching the spacer main body 3 are fixed to each other by implants or the like (not shown) so that they do not move. At this time, the plurality of upper and lower claw portions 17 on the spacer main body 3 bite into the upper and lower vertebrae to produce an effect of preventing withdrawal. And the ridges of the plurality of claw portions 17 are put into contact with almost whole surface of endplates of the upper and lower vertebrae because the ridges are formed along the arc-shaped curved surfaces 21A and 21B the top portions of which are positioned at the middle portion in the back and forth direction of the spacer main body 3. For this reason, the intervertebral spacer 1 is stably fixed between the vertebrae to thereby solve the problems of the related art.

[0016]

Fig. 2 shows a second embodiment of the present invention. The constituent parts performing the same functions as the constituent parts shown in the first embodiment are denoted by the same reference symbols and their descriptions will be omitted.

[0017]

This second embodiment is different from the first embodiment in the point that the imaginary slanting planes 19A and 19B are formed in planes 23A and 23B parallel to each other and is the same in the other points of construction as the first embodiment.

[0018]

This second embodiment can produce the same effect as the first embodiment.

[0019]

[Effect of the Invention]

As described above, according to the invention, when the spacer main body is inserted between the vertebrae after the intervertebral disk is removed, the spacer main body can be easily inserted and not easily withdrawn therefrom. In addition, after the spacer main body is inserted, the spacer main body is put into contact with almost whole surface of the upper and lower vertebrae. For this reason, the intervertebral spacer is stably fixed between the vertebrae to thereby solve the problems of the related art.

[Brief Description of the Drawings]

[FIG. 1]

Fig. 1 is a view illustrating an intervertebral spacer according to a first embodiment of the present invention.

[FIG. 2]

Fig. 2 is a view illustrating an intervertebral spacer according to a second embodiment of the present invention.

[FIG. 3]

Fig. 3 is a view illustrating a conventional intervertebral spacer and the state during use thereof.

[Explanation of the Reference Numerals]

- 1 intervertebral spacer
- 3 spacer main body
- 5 upper surface
- 7 lower surface
- 9 front end portion
- 11 rear end portion
- 13 top portion
- 15 tool engagement portion
- 17 claw portions (withdrawal prevention portion)
- 19A, 19B slanting planes
- 21A, 21B curved surface

[Name of Document] Abstract

[Abstract]

[Object] To provide an intervertebral spacer that is easily inserted between the vertebrae and not easily withdrawn therefrom and that is put into excellent contact with an end plate of the vertebra.

[Solving Means] The upper and lower surfaces 5 and 7 of an intervertebral spacer inserted between the vertebrae of a spine are formed in the shape of a curved surfaces 21A and 21B each having a top portion 13 at the middle portion in the back and forth direction. The above-mentioned upper and lower surfaces 5 and 7 are provided with a plurality of claw portions 17 for preventing withdrawal. Further, the intervertebral spacer is formed in a shape of a curved surface that is tapered toward a front side.

[Selected Figure] Fig. 1

[Name of Document] Drawings

[Fig. 1]

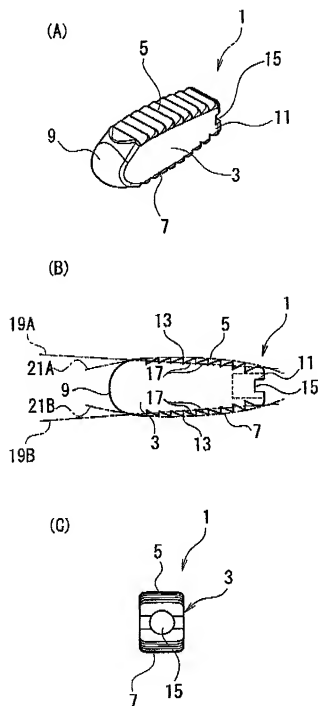
[Fig. 2]

[Fig. 3]

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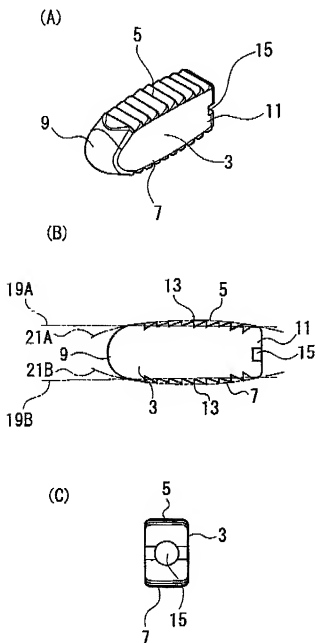
【書類名】 図面

【図1】 Fig.1



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【図2】 Fig.2



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【図3】 Fig.3

